

# **Applied Mathematics Letters**

---

**an international journal of rapid publication**

---

**List of Contents and Author Index  
Volume 3, 1990**



**PERGAMON PRESS**  
Oxford • New York • Beijing • Frankfurt  
São Paulo • Seoul • Sydney • Tokyo

---

# Applied Mathematics Letters

## an international journal of rapid publication

---

### Publishing Office

Journals Production Unit, Pergamon Press plc,  
Hennock Road, Marsh Barton, Exeter, Devon  
EX2 8NE, England [Tel. (0392) 51558; Fax  
425370].

### Advertising and Subscription Offices

*North America:* Pergamon Press Inc., Fairview  
Park, Elmsford, NY 10523, U.S.A.

*Rest of the World:* Pergamon Press plc,  
Headington Hill Hall, Oxford OX3 0BW,  
England [Tel. (0865) 794141; Fax 60285].

### Annual Subscription Rates 1991

Annual institutional subscription rate, DM  
440.00; 2-year institutional subscription rate,  
DM 836.00 (including postage and insurance).  
A personal subscription rate for those whose  
library subscribes at the regular rate is available  
on request. All prices subject to amendment  
without notice. Note: frequency changes to 6  
issues/annum in 1991.

### Back issues

Back issues of all previously published volumes,  
in both hard copy and on microform, are available  
direct from Pergamon Press offices.

### Published Quarterly

### Copyright © 1990 Pergamon Press plc

It is a condition of publication that manuscripts  
submitted to this journal have not been published  
and will not be simultaneously submitted or  
published elsewhere. By submitting a manuscript  
the authors agree that the copyright for their  
article is transferred to the publisher if and  
when the article is accepted for publication.  
However, assignment of copyright is not required  
from authors who work for organizations

---

### Managing Editor

Ervin Y. Rodin

### Editorial Assistant

Kathryn A. Schallert

Department of Systems Science and Mathematics  
Box 1040, Washington University  
St Louis, MO 63130, U.S.A.

Tel.: 314-889-6007 or 889-5806

E-mail: rodin@rodin.wustl.edu

which do not permit such assignment. The  
copyright covers the exclusive rights to repro-  
duce and distribute the article, including  
reprints, photographic reproductions, microform  
or any other reproductions of similar nature and  
translations. No part of this publication may  
be reproduced, stored in a retrieval system or  
transmitted in any form or by any means, elec-  
tronic, electrostatic, magnetic tape, mechanical,  
photocopying, recording or otherwise, without  
permission in writing from the copyright holder.

### PHOTOCOPYING INFORMATION FOR USERS IN THE U.S.A.

The Item-fee Code for this publication indicates that  
authorization to photocopy items for internal or per-  
sonal use is granted by the copyright holder for  
libraries and other users registered with the Copyright  
Clearance Center (CCC) Transactional Reporting  
Service provided the stated fee for copying beyond  
that permitted by Section 107 or 108 of the U.S.  
Copyright Law is paid. The appropriate remittance of  
\$3.00 per copy per article is paid directly to the  
Copyright Clearance Center Inc., 27 Congress Street,  
Salem, MA 01970, U.S.A.

*Permission for other use.* The copyright owner's con-  
sent does not extend to copying for general distri-  
bution, for promotion, for creating new works, or for  
resale. Specific written permission must be obtained  
from the publisher for such copying.

In order to make this issue/volume available as econ-  
omically and as rapidly as possible, the authors' type-  
scripts have been reproduced in either their original or  
reprocessed T<sub>E</sub>X format. The authors/Texnological  
Associates are fully responsible for the quality and  
content of the text.

*The Item-fee Code for this publication is:  
0893-9659/90 \$3.00 + 0.00*

©™The paper used in this publication meets the  
minimum requirements of American National Stan-  
dard for Information Sciences—Permanence of Paper  
for Printed Library Materials, ANSI Z39.48-1984.

## List of Contents

### NUMBER 1

**P. Bernhard and J. Shinar** 1 On finite approximation of a game solution with mixed strategies

**A. Eden, B. Michaux and J.M. Rakotoson** 5 Some results on doubly nonlinear parabolic equations as dynamical systems

**L. Jódar** 9 Analytic solution for a class of discrete-time Riccati equations arising in Nash games

**L. Jódar and E. Navarro** 15 On complete sets of solutions for polynomial matrix equations

**R.N. Kalia and S. Keith** 19 Fractional calculus and expansions of incomplete gamma functions

**K. Kitahara** 23 A note on approximation by step functions

**S.A. Maggelakis and J.A. Adam** 27 Note on a diffusion model of tissue growth

**B.N. Mandal and P.K. Kundu** 33 Incoming water waves against a vertical cliff

**M. Nunokawa, S. Owa and H. Saitoh** 37 On the rate of change of  $\arg df(z)$  and  $\arg f(z)$

**S. Owa, M. Obradovic and M. Nunokawa** 41 On certain analytic functions and subordinations

**B. Pourbabai** 47 A Markovian queueing transportation network problem

**R. Quintana Jr** 51 Manifolds in the Schwarzschild and Kerr metrics

**R. Racke** 53 A unique continuation principle and weak asymptotic behavior of solutions to semilinear wave equations in exterior domains

**A.G. Ramm** 57 Property C and uniqueness theorems for multidimensional inverse spectral problems

**A.G. Ramm** 61 Algorithmically verifiable characterization of the class of scattering amplitudes for small potentials

**D.C. Sanyal and S.K. Samanta** 67 Hydromagnetic flow of a rarefied gas in a horizontal channel with volume sources or sinks of mass

<b>R. Srivastava</b>	71	A theorem on generating functions and its applications
<b>B. Fuchssteiner and G. Oevel</b>	75	Action-angle representation of multisolitons
<b>C. Jeffries</b>	79	Dense memory with high order neural networks
<b>C. McCrosky and D. Dutta</b>	83	A type-theoretic semantics of arrays
<b>I.E. Schochetman</b>	89	Pointwise versions of the maximum theorem with applications in optimization
<b>T. Strzalkowski</b>	93	An algorithm for inverting a unification parser into an efficient generator
<b>A. Tornambe</b>	97	Use of high-gain observers in the inverse kinematic problem
	i	Instructions for authors
	iii	Sample pages for authors

## NUMBER 2

<b>K.E. Ahmad and N.S. Abd El-Hakim</b>	1	The identifiability of finite mixing of some noncentral distributions
<b>I.K. Argyros</b>	5	Some projection methods for the approximation of implicit functions
<b>N. Balakrishnan</b>	9	Modified Vogel's approximation method for the unbalanced transportation problem
<b>LL.G. Chambers</b>	13	Special integrals of the Hamilton-Jacobi equation
<b>U.J. Choi and D.Y. Kwak</b>	17	Almost sure convergence of a finite element approximations for the random Sturm-Liouville boundary value problem
<b>C. Constanda</b>	21	Complete systems of functions for the exterior Dirichlet and Neumann problems in the bending of Mindlin-type plates
<b>T.K. DeLillo</b>	25	A note on Rengel's inequality and the crowding phenomenon in conformal mapping
<b>A.W.M. Dress and W. Wenzel</b>	29	Matroidizing set systems: A new approach to matroid theory

<b>A.W.M. Dress and W. Wenzel</b>	<b>33</b>	Valuated matroids: A new look at the greedy algorithm
<b>D. Dubois and H. Prade</b>	<b>37</b>	Scalar evaluations of fuzzy sets: Overview and applications
<b>K. Farahmand</b>	<b>43</b>	Random polynomials
<b>F. Flandoli</b>	<b>47</b>	A counterexample in the boundary control of parabolic systems
<b>L. Jódar and J.L. Morera</b>	<b>51</b>	Singular perturbations for systems of difference equations
<b>O. Kaleva</b>	<b>55</b>	The calculus of fuzzy valued functions
<b>J. Langer and R. Perline</b>	<b>61</b>	The Hasimoto transformation and integrable flows on curves
<b>E.B. Lin and M.Y. Chou</b>	<b>65</b>	Optimal contracts
<b>G. Mehta</b>	<b>69</b>	Maximal elements of condensing preference maps
<b>M.A. Noor</b>	<b>73</b>	Mixed variational inequalities
<b>R. Ravindran and P. Prasad</b>	<b>77</b>	A new theory of shock dynamics, Part I: Analytic considerations
<b>D. Rolling and L. Debnath</b>	<b>83</b>	The Cauchy-Poisson waves in an inviscid rotating stratified liquid
<b>M. Spivack</b>	<b>87</b>	Operator splitting for the random wave moment equations
<b>R.P. Tewarson, S. Kim and J.L. Stephenson</b>	<b>93</b>	Using quasi-Newton methods for kidney modeling equations
<b>L. Xu-Duan and C. Chang-nian</b>	<b>97</b>	Classes of GSFR sequences and their fast generation
	<b>i</b>	Instructions to authors
	<b>iii</b>	Sample pages for authors

### NUMBER 3

<b>K. E. Ahmad and N.S. Abd El-Hakim</b>	<b>1</b>	Random sampling from a truncated bivariate normal distribution
<b>R. Ahlswede</b>	<b>5</b>	Coding for channels with localized errors:the non-binary cases

<b>A. Ambrosetti, M. Calahorrano and F. Dobarro</b>	<b>9</b>	Remarks on the Grad-Shafranov equation
<b>J. Barhen, N. Toomarian and S. Gulati</b>	<b>13</b>	Application of adjoint operators to neural learning
<b>B. Codenotti</b>	<b>19</b>	Parallel solution of linear systems by repeated squaring
<b>V. Dahl and P. Massicotte</b>	<b>21</b>	Interpreting static discontinuity grammars in Prolog
<b>P. Degonad and P.A. Markowich</b>	<b>25</b>	A one-dimensional steady-state hydrodynamic model for semiconductors
<b>A. Eden, B. Michaux and J.M. Rakotoson</b>	<b>31</b>	Error analysis of nonlinear evolution equations and associated dynamical systems
<b>B.R. Feiring</b>	<b>35</b>	A quadratic programming view of the linear complementary problem
<b>D. Funaro</b>	<b>39</b>	Inverse inequalities for Chebyshev approximations in $L^\infty$ norms
<b>A.L. Gorin, L. Auslander and A. Silberger</b>	<b>43</b>	Balanced computation of two-dimensional transforms on a tree machine
<b>T.A. Gulliver and V.K. Bhargava</b>	<b>47</b>	Some properties of self-reciprocal polynomials
<b>K.H. Hoffmann, P. Sibani, J.M. Pedersen and P. Salamon</b>	<b>53</b>	Optimal ensemble size for parallel implementations of simulated annealing
<b>J.-Q. Hu</b>	<b>57</b>	Steady-state sample path derivative estimators
<b>L. Jódar and J.L. Morera</b>	<b>61</b>	Singular perturbations for systems of second order difference equations
<b>C.-H. Huang, J.R. Johnson and R.W. Johnson</b>	<b>67</b>	A tensor product formulation of Strassen's matrix multiplication algorithm
<b>C.T. Lenard</b>	<b>73</b>	Laguerre's iteration and the method of traces for eigenproblems
<b>A. Bayliss and B.J. Matkowsky</b>	<b>75</b>	Spinning cellular flames
<b>M.A. Noor and A.K. Khalifa</b>	<b>81</b>	Quintic splines method for solving contact problems
<b>F.A. Al-Thukair and M.A. Noor</b>	<b>85</b>	Complementarity problems in semi-inner product spaces

<b>M.J. Panik</b>	89	Farkas' theorem under convex combination
<b>B. Pourbabai</b>	91	A class of chance constrained network optimization problems
<b>R. Rach and A. Bagdasarian</b>	101	On approximate solution of a nonlinear differential equation
<b>A.G. Ramm and G.Q. Xie</b>	103	Uniqueness result for inverse problem of geophysics II
<b>P. Prasad and R. Ravindran</b>	107	A new theory of shock dynamics - Part II: numerical solution
<b>P.K. Sahoo</b>	111	Circularly symmetric separable functions are Gaussian
<b>G.P. Samanta</b>	115	Fluctuation and stability in a diffusive predator-prey system.
<b>G.P. Samanta and C.G. Chakrabarti</b>	119	On stability and fluctuation in Gompertzian and logistic growth models
<b>A.-M. Wazwaz</b>	123	A modified third-order Runge-Kutta method
<b>B. Wendroff</b>	127	Cooperation in a three-way arms race
<b>M. Zak</b>	131	Weakly connected neural nets

#### NUMBER 4

<b>J.J.A.M. Brands</b>	1	Asymptotics of a certain integral
<b>B.N. Mandal and P.K. Kundu</b>	5	A note on the reflection coefficient in a water scattering problem
<b>L. Jódar</b>	9	Explicit solutions of Riccati equations appearing in differential games
<b>P.R. Parthasarathy and N. Balakrishnan</b>	13	A continued fraction approximation of the modified Bessel function $I_1(t)$
<b>G. Caginalp and G.B. Ermentrout</b>	17	A kinetic thermodynamics approach to the psychology of fluctuations in financial markets
<b>A. Shidfar and A.A. Sadeghi</b>	21	On the periodic solutions of certain nonlinear oscillators
<b>G. Stengle</b>	25	Numerical methods for systems with measurable coefficients
<b>B.R. Feiring</b>	31	Some properties of matrices from certain binary mathematical programming problems

<b>A. Repaci</b>	<b>35</b>	Nonlinear dynamical systems: On the accuracy of Adomian's decomposition method
<b>A.G. Ramm</b>	<b>41</b>	Uniqueness theorems for 3D inverse problems with incomplete data
<b>P.C. Dauby and G. Lebon</b>	<b>45</b>	Constitutive equations of rheological materials: Towards a thermodynamic unified approach
<b>A.S. Abd El-Rady</b>	<b>49</b>	Modification to the Friedrichs integral inequality
<b>G.A. Kriegsmann and C.L. Scandrett</b>	<b>51</b>	Decoupling approximations for structural acoustic interactions
<b>J.-Q. Hu and S.G. Strickland</b>	<b>55</b>	Strong consistency of sample path derivative estimates
<b>I.M. Gamba</b>	<b>59</b>	Behavior of the potential at the pn-junction for a model in semiconductor theory
<b>R. Bru and R. Fuster</b>	<b>65</b>	Parallel chaotic extrapolated Jacobi method
<b>S. Mitnik</b>	<b>71</b>	Modeling nonlinear processes with generalized autoregressions
<b>J. Hofbauer and K. Sigmund</b>	<b>75</b>	Adaptive dynamics and evolutionary stability
<b>F. Lara-Ochoa and V.P. Bustos</b>	<b>81</b>	Conflicting density dependent dynamics of a bacterial population

